Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: February 2006

Questions regarding this report should be directed to:

Jim Sung
California Department of Water Resources
Division of Environmental Services
3251 S Street
Sacramento, CA 95816-7017

Telephone: (916) 227-7520
sung@water.ca.gov

TABLE OF CONTENT

4. List of Figures

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of February, 2006, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of February was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations C-2, S-64, S-49, S-42 and S-21 are 8.0 mS/cm during February 2006. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for February 2006 started off above 50,000 cfs and continued to rise to a monthly peak of about 92,000 cfs on February 8. Thereafter, outflow declined and continued to decrease to about 28,000 cfs on February 24 and remained leveled until February 26, where it began to rise and ended the month with an outflow of about 41,000 cfs. The tail end rise in outflow was a result of two consecutive days of precipitation events on February 27 and 28. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for February 2006 is listed below:

Month	Mean NDOI (cubic feet per second)
February	54,537

2.3 Rainfall

February 2006 total of 4.02 inches was very close, but still lower than previous month January 2006 total of 4.13 inches. The month's largest precipitation occurred on February 27, with a total of 1.93 inches.

Month	Total Rainfall (inches)
February	4.02

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during February 2006 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
February 1 – 28	Open	Out	Open

Due to continued favorable salinity levels in the marsh, the gates remained inoperable with flashboards still out of the maintenance channel for levee repair work. DWR will continue to monitor salinity levels in the marsh and will re-operate the gates and install the flashboards if conditions warrant.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During Februay 2006, salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), Sunrise Club(S-21), and Volanti(S-42) were all below 2.5 mS/cm as shown in Figure 1. Despite February 2006 low total precipitation amount, high outflow carry over from the two previous months and some precipitations in February 2006 made it impossible for marsh salinity to inch upward. The marsh system was so fresh that salinity levels flatten out because it reached its maximum salinity level of freshness. At the two monitoring stations, S-97 and S-35, salinity levels were also less than 4.0 mS/cm for the entire February, which is very impressive compared to last year February salinity levels which ranged between 5.0 mS/cm and 7.0 mS/cm at these two monitoring stations. S-35 salinity level is higher than S-97 probably due to salt water intrusion from overtopping of Bay water via Grizzly Island refuge.

Overall, salinity levels at the end of February 2006 were well below standards at all compliance and monitoring stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for February 2006 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations resembles that of 2005, but lower in magnitude at all stations. Compared to previous nine years, February 2006 salinity levels were ranked sixth in high Specific Conductance.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

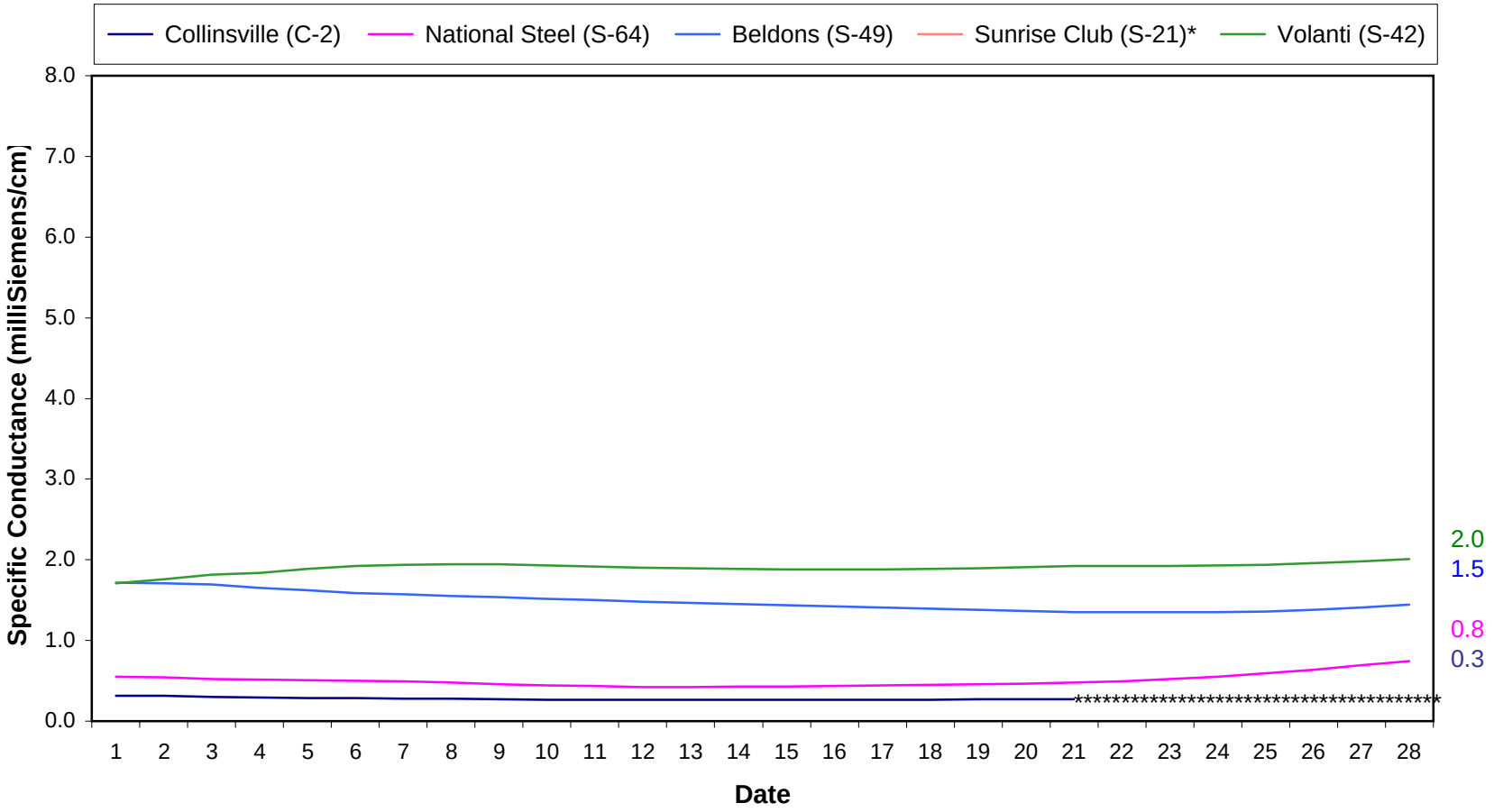
February 2006

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.3***	8.0	Yes
S-64	0.8	8.0	Yes
S-49	1.5	8.0	Yes
S-42	2.0	8.0	Yes
S-21****	n/a	8.0	Yes

*milliSiemens per centimeter
**The representative data from nearby USBR station is used in lieu of data from station C-2.
***End of month PDM value not representative of entire month due to missing data resulting from equipment problem, however, the number of missing data is not enough to alter the overall result.
****station data was not accessible due to flood water, thus salinity information is not reported. However, salinity levels throughout the marsh was so fresh that standard at this station was likely met.

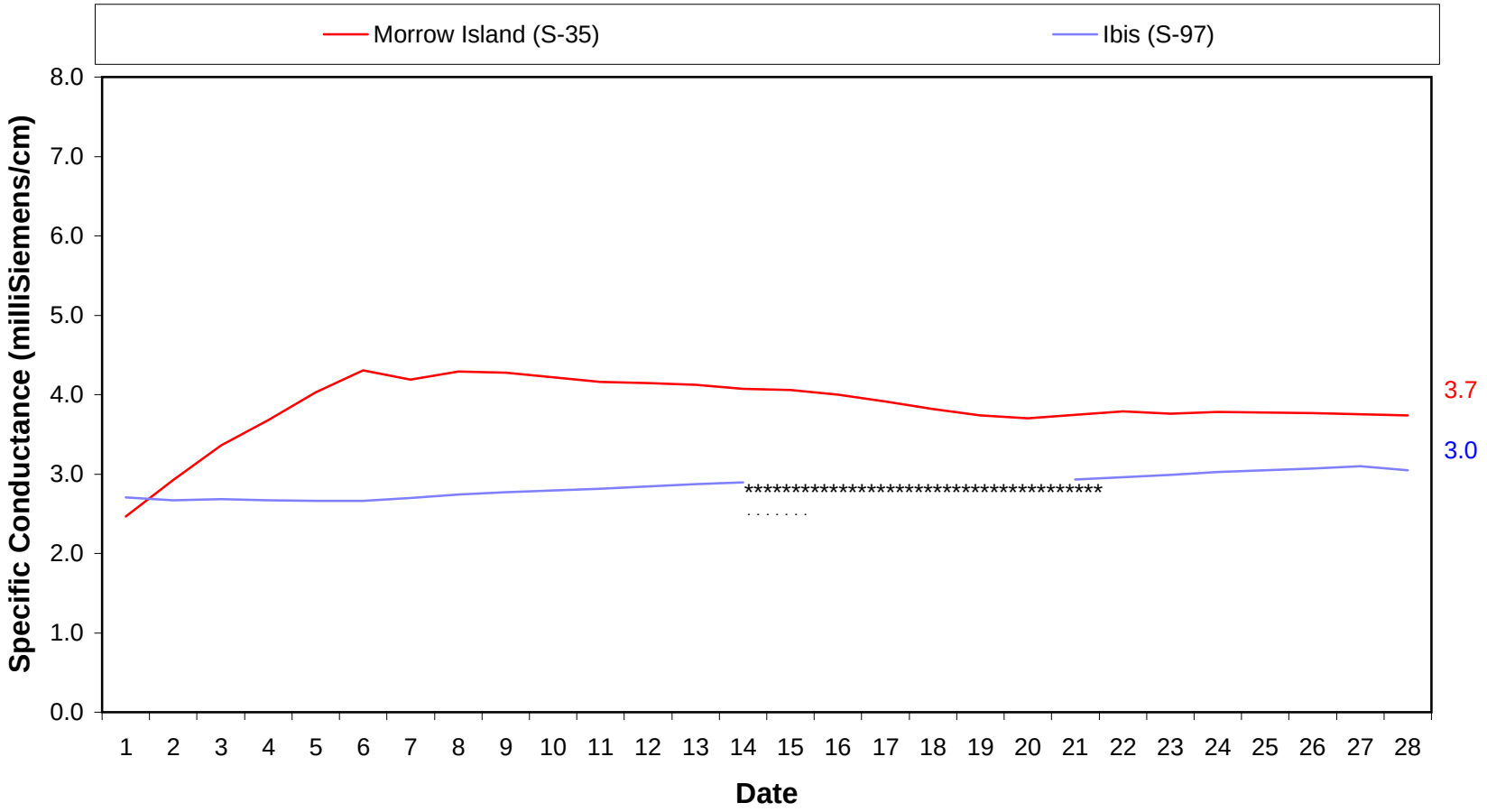
Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
February 2006

Standard = 8.0 mS/cm



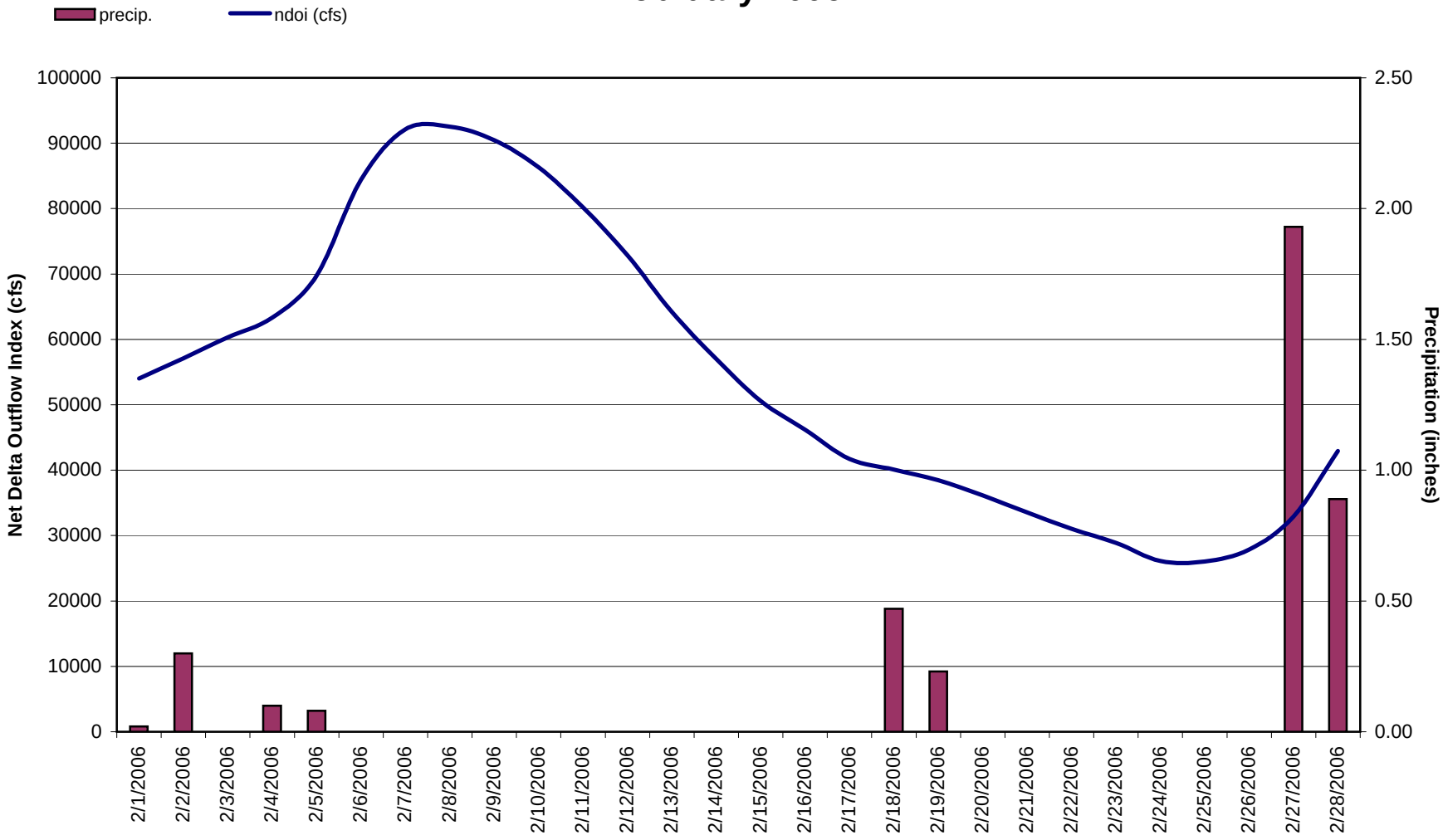
*S21 data not available due to flooded levees and inaccessible roads.
*******missing data due to equipment problem.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
February 2006



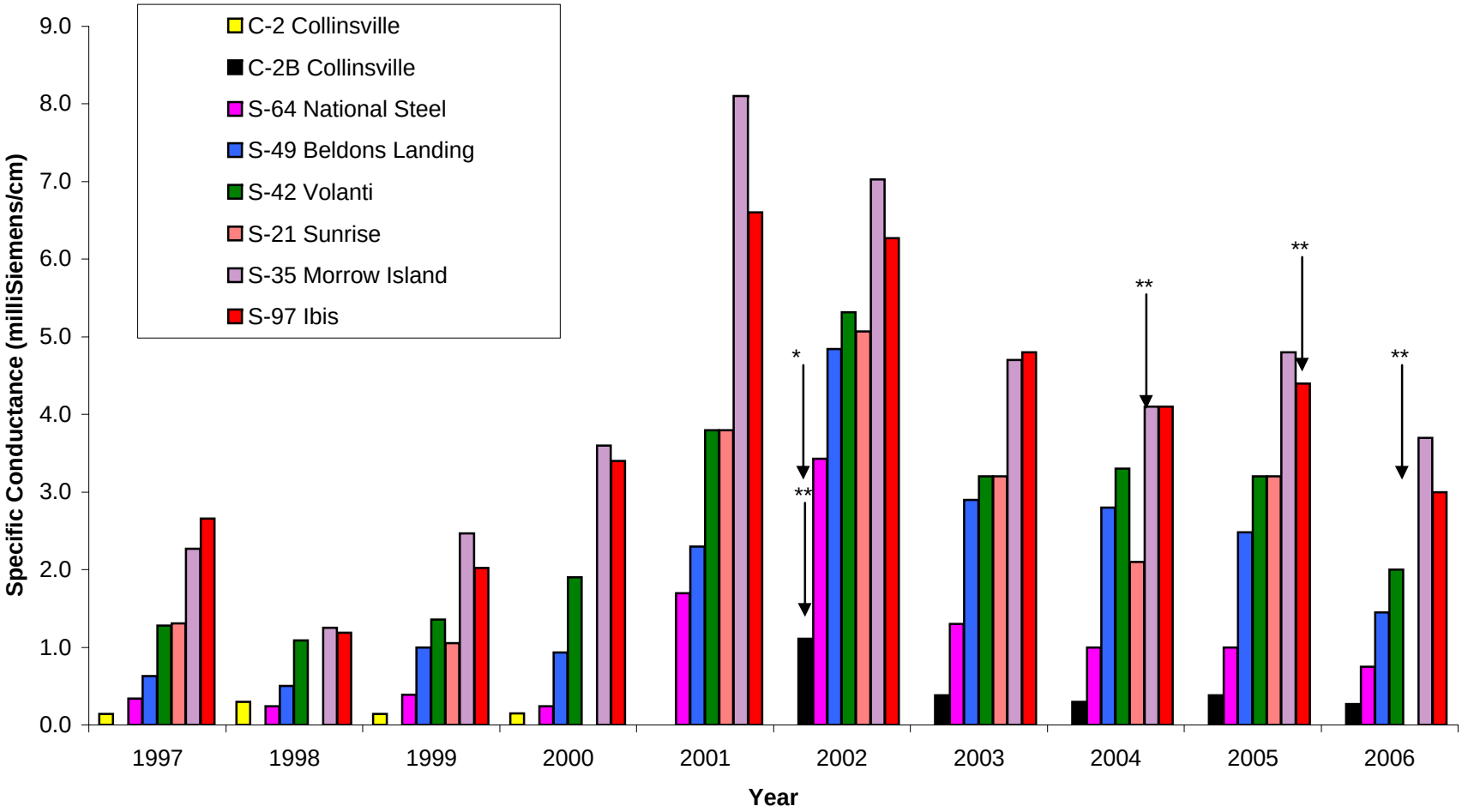
*******missing data due to equipment problem.

Figure 3. Daily Net Delta Outflow Index and Precipitation*
February 2006

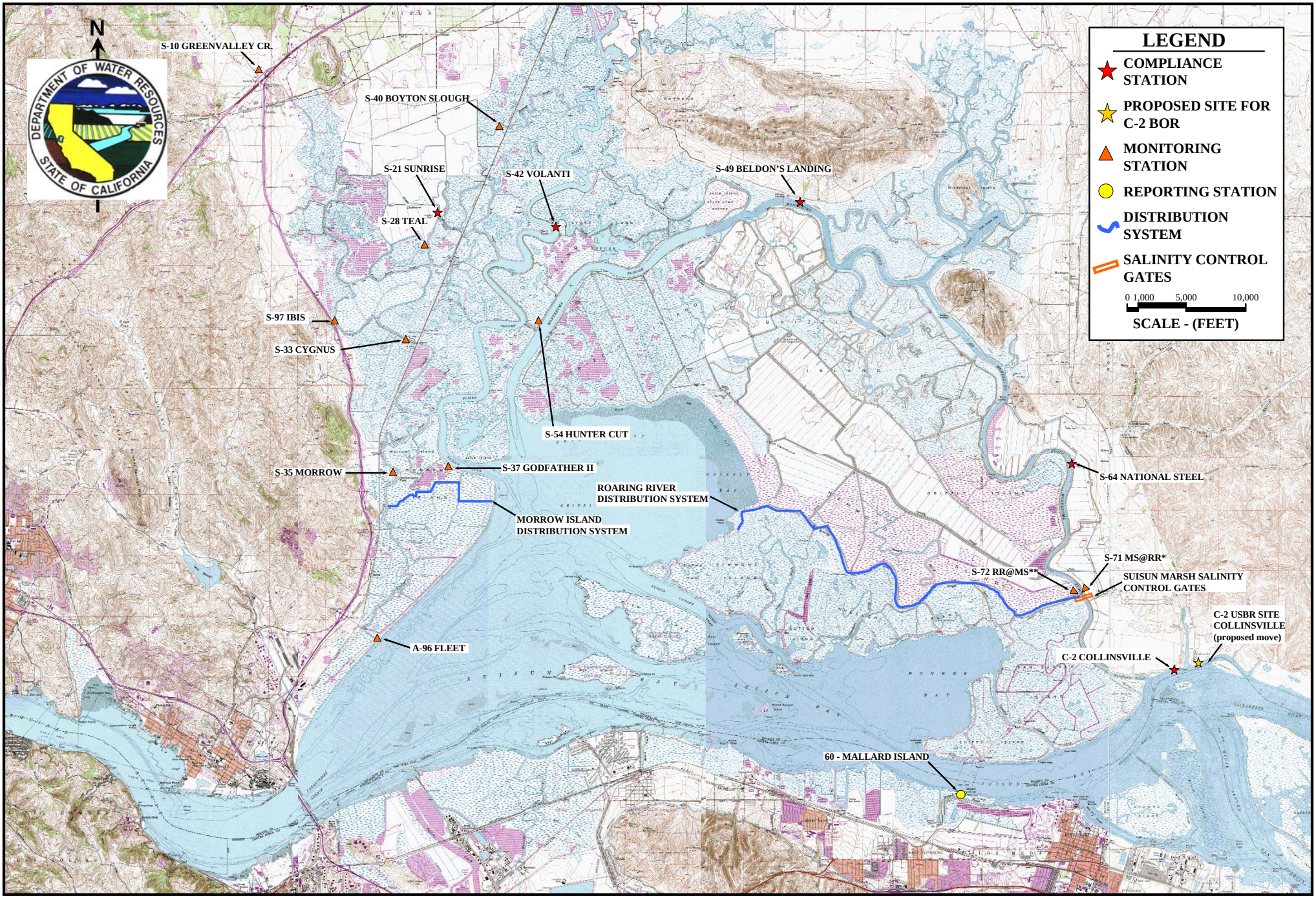


*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations February of 1997-2006



*Representative data from nearby USBR station is used in lieu of station C-2 from 2002 and thereafter.
**Data missing due to equipment failure. Number of missing data is small enough not to alter end of month value.
***Data not available due to flooded levees and inaccessible roads.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES